

**JULY 2013  
ISSUE**

# PARTICLE POST

COLLIDER-ACCELERATOR DEPARTMENT

Contact: [C. Scholl](#)

PREVIOUS ISSUES

June 2013

[{HOME PAGE}](#)

[BNL WEBSITE](#) | [C-AD WEBSITE](#) | [ES&F WEBSITE](#) | [BERA](#) | [BNL CLASSIFIED ADS](#) | [INSIDE RHIC](#)

Quote of the Month: "SCIENCE IS THE GREAT ANTIDOTE TO THE POISON OF ENTHUSIASM AND SUPERSTITION." - Adam Smith

## **A WORD FROM THE:**

Administration

Accelerator Div.

ES&F Div.

Acc. R&D Div.

Operations

▶ Arrivals/Departures

 Safety Stats



## NOTE FROM OUR CHAIR: Thomas Roser

We finally know our budget for this fiscal year and fortunately the RHIC budget didn't receive any further cuts. For next year everything is still up in the air. Even though the President's, the Senate's and the House's budget all are quite good for RHIC an overall agreement on the budget is very unlikely and we will start the fiscal year again with a Continuing Resolution. Even in this case we aim to start the cool down for the next run at the beginning of next year.

Ilan Ben-Zvi is preparing a proposal to upgrade the Accelerator Test Facility (ATF) with a new 100 TW laser and to move the facility to the large experimental hall of building 912 with room for additional beam lines. The new ATF together with the nearby test ERL will then represent world leading electron accelerator technology, for which we are proposing the name "Accelerator Science and Application Center".

## DID YOU KNOW??

*Did you see the SUPER MOON??* Take a look at Steve Bellevis photo of the [super moon](#), it is magnificent.

*Check out who received an employee Service Award this year!* 2013 Collider-Accelerator Dept. employees who received a Service Award are listed [here](#). Last Years Service Awards are listed [here](#).

*The C-AD BBQ has been announced to be on July 10th!* Please purchase your tickets with your administrative assistant before July 3rd to save \$3.

*Check out who received Engineering [Awards!](#)*

*Check out Robert Todd's daughter Emma playing the Viola and her friend Lindsey on the piano!* There is an intrinsic link between music and the physical world that even Einstein recognized.  
<http://www.youtube.com/watch?v=ss3Qcb1Y9Ao>

Eric Riehn (on the right in the photo) has been leading the polarized cathode preparation effort (see under Accelerator R&D Division tab) as a post doctoral fellow, working with Omer Rahman (on the left), a Stony Brook graduate student. This is an opportunity to bid

## EVENTS/SEMINARS...



Check out the [BNL Calendar](#) for upcoming events & Seminars or the [Upcoming Conferences & Workshops](#) page for workshops and Conferences happening at BNL.

July 10 ~ (Bldg 510 | 2:00) High Energy Physics & RIKEN Theory Seminar, "TBA" Presented by Ning Chen (Tsinghua U., China)

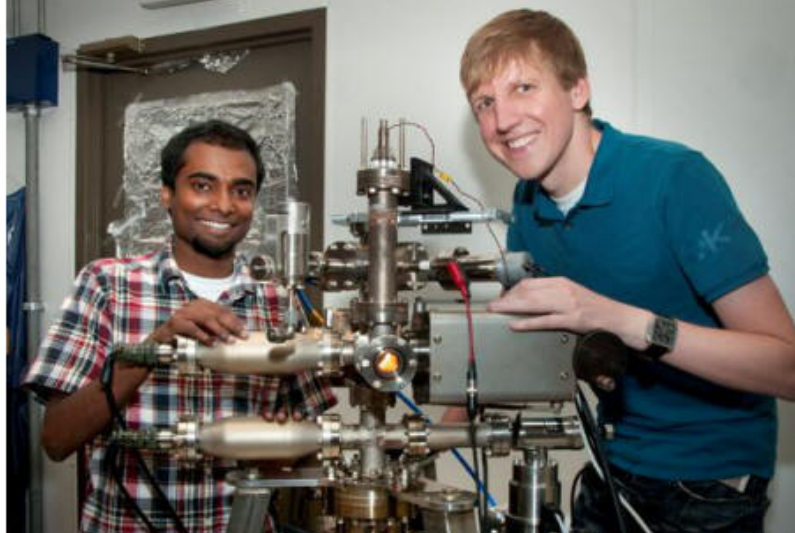
July 16 ~ (Bldg 510 | 3:30) Sambamurti Lecture, "The Controversy and Quark & Gluon Angular" Presented by Elliot Lipeles (U. of Pennsylvania)

July 17 ~ (Berkner Hall [Aud] | 4:00) 488th Brookhaven Lecture, "TBD" Presented by Yun Luo (CAD)

July 18 ~ (Berkner Hall [Aud] | 4:00) Brookhaven Women in Science Event, "Incentives for Innovation!" Presented by Gustavo Manso (U. of California, Berkley)

July 25 ~ (Bldg 510 | 3:00) Particle Physics Seminar, "TBA" Presented by Ranjan Dharmaapalan (U. of Alabama)

July 26 ~ (Berkner Hall (A) | 8:00) Colloquium ~ "Atmospheric Chemistry Colloquium for Emerging Senior Scientist (ACCESS XII)".



## IN OTHER NEWS...

*By using different carrier wavelengths, Fiber optics cables transmit several beams simultaneously. Now, a team from Boston University and the University of Southern California has demonstrated an additional means to multiplex: using beams that have different amounts of orbital angular momentum... [Read more](#)*

***Focus: A Quantum Dot Shows Its True Colors*** ~ [Read](#) about a surprising discovery: manganese-doped zinc-cadmium-sulfur nanoparticles of the same size emit light in a range of wavelengths. The reason appears to be that the wavelength depends on how close the manganese ions are to the surface of the nano particle

***The March of the Penguin Diagrams*** ~ Particle theorist John Ellis lost a game of darts and, with it, a bet: His next paper had to include the word "penguin." He honored the bet and coined a term that became part of the vocabulary of CP violation within the Standard Model of particle physics.. [Read about it](#)

***As Most of you know the g-2 Magnet is on it's way to FNAL! Check out some [pictures](#) and if you hadn't already, [read](#) about it!***





**Interested in Cycling?** Why don't join in on the [Huntington Bicycle Club's Gold Coast Tour](#) on Long Island; [The 5th Annual Brooklyn Waterfront Epic Ride](#) or in AUGUST [Winning Campaigns Training & Brooklyn Unicycle Day!](#)

**Interested in Running or Walking?** Check out the [lirunning June Calendar](#) for the following events: LIU CW Post 5k; Thuder Run; Bellport Clipper Classic 5k; NYS Park Summer Series 4K; Fire Island Run for the Roses; Long Beach Run Biathlon, etc.. There are some fun Mud run's coming up as well, please see [Tomcat](#) or [Urbanathlon](#).

**For the Kids:** American Idol (August); Sesame Street Live (September) @ [The Nassau Coliseum](#).  
Sept. 15 Italian Festival @ Hofstra

#### **Stony Brook Events:**

**Jewels & Jeans 2013:** June 18 Dress in your Finest/ Live & Silent Auction.

**Horse Drawn Carriage Rides:** Through Stony Brook Village July 11 ~August 29, 6pm to dusk/ \$3 pp

**LI's Auto Racing Heritage:** July 13-Sep 2 (10-5) \$4pp \$2 for kids. See & Hear about LI's 5 race tracks as well as vintage memorabilia.

**Sunday Summer Concerts on the Green:** July 14-Aug 25 (7-9) on the Stony Brook Village Green.

**July 13- Nassau Coliseum the VANS Warped Tour!**



The **Warped Tour** is a touring music and extreme sports festival. The tour is held in venues such as parking lots or fields upon which the stages and other structures are erected. The skateboard shoe manufacturer Vans, among others, has sponsored the tour every year since 1995, and it is often referred to as the **Vans Warped Tour**. The tour started out as a showcase for punk rock music, but its more recent line-ups have featured a diversity of genres.

**Macari Vineyard** ~ [MATTITUCK] Harvest East End (Aug 24 | 7-9:30pm) Join 42 winemakers & 32 Top regional Chefs to savor the flavors of the East End @ Mcall Vineyard & Ranch.

**Duckwalk North** ~ [SOUTHOLD] June 29 (7-10pm) ~ Opera of the Hamptons \$45 pp

**Duckwalk South** ~ [WATER MILL] July 5 & 26, August 9 & 23, Sept. 6 (5-8pm) Sunset Music with Shari Yeomans; July 8 & Sept. 2 (2-5pm) Live Music: Jupiter Fell; July 12 & 26, Aug. 16 & 30 (5:30-8:30pm) Sunset Music: Liza Coppola; July 21 (4-7) Calypso on the Vine \$125 pp;

**Castello di Borghese Vineyard & Winery** ~ [CUTCHOGUE] \*\* Vineyard Tours & Wine Tastings Every Saturday @ 1pm & FREE Jazz Every Saturday (2-4) with Marguerite Volonts\*\* July 6 (7pm) Haft2Laugh Comedy Night \$25 pp;

**Jamesport Vineyards** ~ No Events Posted

**Martha Clara Vineyards** - [RIVERHEAD] JULY 4 (10am) Vines & Canines EDU walk (1-4) Live Music: Two Man Acoustical Jam; July 6 (2-6) Live Music: Playn & Symple; July 7 (7:30) Flash back to the 80's with White Wedding Band; July 13 (1-5) Live Music: Keith Maquire; July 14 ~ Summer Education Series \$30 pp/ (1-5) Live Music: Quadralove Reggae; July 19 (1-5) Live Music: Entrpy; July 21 ~ (1-5) Live Music: Sugar & Spice Soul Band ; July 26 (1-5) Live Music: Ska & Reggae with the Scofflaws; July 27 (1-5) Live Music: Bobby Nathan Band; July 28 (1-5) Live Music: Mambo Loco.. Upcominh in AUGUST ~ 3 (1-5) Live Music: Playn & Symple; Aug 4 (12:30-4:30) Live Music: Two Man Acoustical Jam; Aug 10 (2-6) Live Music: Ted Hefko & the Thousandaires; Aug 11 (1-5) Live Music: The Sea Monkeys; Aug 16 (7:30pm) Country Music & Line Dancing with the Road House Band \$12:50 pp

**Palmer Vineyards** - [RIVERHEAD] \*Courtyard Reservations available 5/18 ~ 8/31\*, \*Live Music every weekend\*, Every Sunday Yoga in the Vineyard (11am) \$25 pp and Mimosa Bar.

## NOTE FROM OUR ADMINISTRATION: Stephanie LaMontagne-McKeon



Nine months into the fiscal year and four months after budget sequestration became a reality, our FY 2013 budget is finally known. While the impact of sequestration on the RHIC Program is less than anticipated, Laboratory overhead is higher than anticipated. During this year's extended period of uncertainty, research organizations throughout the Laboratory made every effort to control cost. Over time, it became apparent that direct research cost would not generate sufficient overhead revenue to sustain support organizations at authorized funding levels and an overhead increase of  $\frac{3}{4}$  percent was implemented in June.

In the final analysis, the total FY 2013 funding for RHIC is less than the amount received in FY 2010 while cost in virtually every cost category excluding power has increased. We have reached the limits of prudent fiscal management and have begun to consume prior funds that, in previous years, have made it possible to commence operations in advance of final budget guidance. In FY 2013, we will consume half of our carry forward funds and without a budget increase in FY 2014, we will need to make every effort to preserve as much of the remaining carry forward as possible. Thus, as we begin planning for maintenance and upgrade activities during RHIC's annual shutdown, it is important that each employee make a commitment to control that cost that is within their ability to control.

In addition to cost control, it is important that we be attentive to the project numbers used on time cards, work orders, web reqs, etc. Many of our personnel are simultaneously involved in multiple efforts, some of which are funded by sources other than DOE Nuclear Physics. All resources, be they labor or material, should be charged to the appropriate program; in instances where the benefit is realized in multiple programs, expense should be shared amongst the programs in proportion to the benefit. Each of us is responsible to the organization to understand what program(s) benefits from our efforts and when we are unsure, to seek clarification.

## NOTE FROM OUR ACCELERATOR DIVISION: Wolfram Fischer



Lou Snyder and Bob Lambiase were the recipients of this year's BNL Engineering Award. Please join me in congratulating both of them on having received this well-deserved honor.

The NSRL Run-13B finished on 28 June, and now only the Tandems and BLIP is running. BLIP operation will continue until the end of the month.

The Nuclear and Particle Physics Program Advisory Committee met on 11-12 June 2013 and recommended as the highest priority for Run-14 operation with Au+Au at 100 GeV/nucleon beam energy. We are likely to also run Au+Au at 7.5 GeV/nucleon at the beginning of Run-14, in order to fill in the last energy in the beam energy scan in search of the critical point in the nuclear matter phase diagram. For Run-15 the Committee recommended a polarized proton run at 100 GeV, and a p+Au run. PHENIX is also interested in a number of other asymmetric combinations, such as d+Au,  $^3\text{He}+\text{Au}$ , p+Al, and p+Cu, and we may run some of those also in Run-15.

In Run-14 we will use full 3D stochastic cooling for the first time for Au+Au, and we plan to install a new superconducting 56 MHz cavity in order to slow down the longitudinal beam size growth from intrabeam scattering. In addition, an increase of the bunch intensity will be a major focus. To prepare for the next runs the RHIC Retreat will take place in the Brookhaven Center on 25 and 27 July 2013, with a closeout session on 31 July 2013.

The catalog of all Technical Notes is <http://www.rhichome.bnl.gov/AGS/InternalReports.html>, and it is linked from both the Department and Accelerator Division home pages.



## NOTE FROM OUR EXPERIMENTAL SUPPORT & FACILITIES DIVISION: Phil Pile



RHIC Run 13 came to an end on Monday morning, 10 June and warm-up of the RHIC cryo system began. The STAR experiment reached its polarized proton goals around mid-May and successfully commissioned a new prototype HFT PXL detector system (3 of 10 sectors) in preparation for Run 14 next year. The PHENIX experiment reached their revised goal for recorded luminosity just before the end of the run. The experiments should now have on tape definitive data sets for 510 GeV polarized proton collisions. The total weeks of cryo operation for this run was 17.4. We plan to begin Run 14 around the first of January 2014 with emphasis on full energy gold running. It was determined near the beginning of Run 13 that the STAR solenoid/detector system was not aligned with the RHIC beams. The error is about 1 centimeter (low). Fortunately the STAR detector system has provisions to allow the system to be raised by more than a centimeter. This was tested prior to the roll-out of the solenoid system into the assembly building, and works, so for Run 14 the solenoid/detector system will be “perfectly” aligned with the beam.

The move of the g-2 experiment to FNAL is progressing with the passing of a major milestone last month. The 50 foot diameter superconducting coils/cryostat assembly is now on a barge heading for FNAL. I suspect that most of you have seen pictures of the ring assembly on the truck or barge in the newspapers. The trip began on Saturday, 22 June from building 919 (home for the g-2 ring for the past 17 years!) with the move by truck ([a BIG truck!](#)) of the ring to the BNL main gate area. This move took about 3 hours as the speed of the truck was limited to ~ walking speed and additional tree trimming was required (workers the Asplundh Tree Experts Company were in the convoy). The ring remained at the BNL main gate until about midnight Sunday and was then moved down William Floyd to the Smith Point Marina where it was loaded onto a large barge. Progress of the barge can be followed on the web (GPS tracker on board) using the link <http://muon-g-2.fnal.gov/bigmove/>. Today the barge is docked in the Chesapeake Bay area at Harbor State Park in Norfolk to avoid bad weather in that area. Once the weather clears the move will continue with the next dicey area (rock issues) coming off Cape Hatteras. The cryostat/coil assembly is very delicate so extra care is in order to ensure the assembly makes it to FNAL without damage. We wish FNAL well with Phase II of this important experiment.

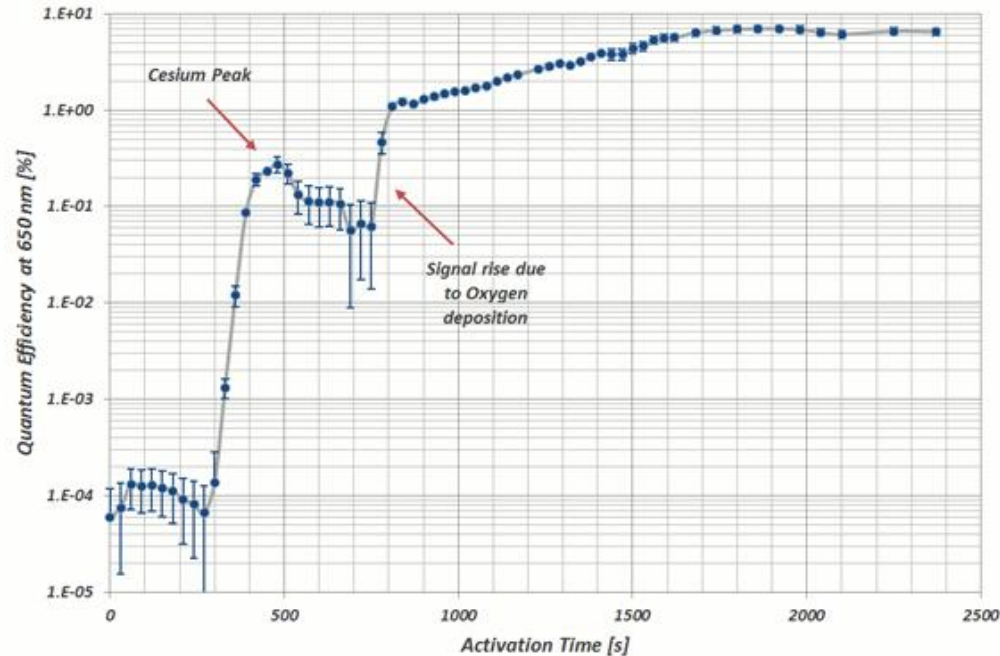
NSRL Run13B for NASA ended on schedule on 28 June. The fall NSRL run is to be scheduled.

BLIP has been running since 17 December and will continue through July.

## NOTE FROM ACCELERATOR R&D DIVISION: Ilan Ben-Zvi



The Gatling Gun Group has made a significant step forward on its way to produce highly intense electron beams for future accelerators. Starting June 2012 the single preparation system ("Tree") has been assembled in building 966. During the next months, a vacuum of  $1 \times 10^{-12}$  Torr (or even less) has been established and components have been tested and calibrated. On 12/27/2012 the group was able to record the first weak photo current from GaAs. After several modifications the quantum efficiency could be increased to approximately 8% - a value which is comparable to literature and is now reliably available. The measurement result, quantum efficiency as a function of time in the activation process is shown in the figure below.



The chamber shown on the picture in the front page will be used in all further stages of the group's projects, i.e. the Multi Cathode Storage Assembly and the Gatling Gun itself.



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The work continues on the optimized cost eRHIC design with 10 GeV electron energy and  $10^{33} \text{ cm}^{-2} \text{ s}^{-1}$  luminosity. We are also investigating a recently proposed vertical FFAG lattice that is naturally isochronous, for a possible use for eRHIC recirculation passes.

At the ATF experiments: Dielectric Wakefield Generation (UCLA) - Initial tests of new woodpile geometry dielectric; found to be a good source of THz radiation. Experiments will continue after the summer.

Plasma Wakefield Acceleration in Quasi-nonlinear regime (UCLA) - Commissioning of new chamber. So far 10  $\mu\text{m}$  beam has been achieved at IP, plasma discharge and spectrometer have been tested.

Activities for the Muon Acceleration Group has centered on further development of a new approach to the 6D cooling of muon beams. In the coming months, this new approach will be evaluated based on comparisons with previously proposed lattices. Holger Witte has continued to advance a magnetic shielding scenario for the experimental hall in which the Muon Ionization Cooling Experiment (MICE) will be run at the Rutherford Appleton Laboratory. His approach appears to be the main contender for a viable solution for the control of stray fields issuing from the many superconducting coils which will be energized during the data taking phase of the experiment.

The 400 MHz crab cavity for LHC upgrade has finished its first cold test in the Small Vertical Test Facility. The cavity was able to reach  $Q_0 \sim 3 \times 10^8$ , and 1.34 MV deflecting voltage in pulsed mode. The cavity will be sent for another round of chemical cleaning to improve the performance.

Simon White, our Toohig fellow, was invited to convene a TLEP working group on beam-beam and collective effects for CERN.

The contract for production of the FEL system for CeC experiment was signed with Budker INP. The preliminary design review is scheduled on the week of July 22nd. Site preparation for the installation of the low energy part has started. The cavity stalk and cathode injection system arrived this week from the Transfer Engineering company of Palo-Alto California. The Cryostat of the 112MHz SRF gun cavity passed all vacuum leak tests and is currently being stored in building 905.

The last of the magnet shields, inner and outer, have arrived for the 56 MHz cryomodule. The shields are being mounted for test fitting.

The inaugural insertion and extraction of the ERL's electron gun metal cathode was successful.

## NOTE FROM OPERATIONS: Paul Sampson



RHIC Run 13 ended last month and work in the tunnel has commenced. Major upgrades, improvements and other large projects planned for both the experiments and the accelerators are underway.

In RHIC, testing of the blue e-lens with electron beam is ongoing, with the first electron beams seen early last month. Progress on the Yellow e-lens continued and cold tests of the Superconducting Solenoid were completed. At present, the Blue e-lens commissioning is scheduled to continue until mid month, when solenoid movement and installation for the final overall configuration will begin.

Shutdown work in the AGS continues. Major efforts are focused on RF, instrumentation and vacuum system upgrades.

The Booster continued with stable, reliable operation providing protons for BLIP and various species of beam for NSRL. The Booster was shutdown on the 28<sup>th</sup> following the final experiments at NSRL for Run 13B. The Booster and NSRL tunnel areas are on restricted access and shutdown work has begun. RF and instrumentation work will be the main focus during this shutdown.

End of run activities in the Booster including Access controls critical device testing were completed.

BLIP will continue to run until the end of the month. LINAC, BLIP and TTB Crossover areas will remain secured except for scheduled access.

To view a list of the approved work for maintenance days or the shutdown, go the [Job Request System](#) and select the appropriate date. This link is behind the firewall and requires privileges to view.

For schedule updates see: [This Week, which can be viewed by all.](#)

## **ARRIVALS: Welcome!**

Steve Peggs ~ (Coming from Magnet Division) Joined C-AD June 1, 2013.

Lisa Muench~ Joining C-AD July 1, 2013 and will be working with Leonard Mausner in the BLIP/RRPL Group.

Dr. Stephan Brroks ~ joined the department as a Collaborator June 10 and will be with us until August 9, 2013. He will be working with Dejan Trbojevic in the R&D Division.

Takeshi Kanesue ~ Joined the department as a Associate Physicist June 10, 2013. He is working with Massimo Okamura and Wolfram Fischer in the Accelerator Division.

Jason Farrell ~ (coming from Physics) joined the Design & Documentation Group June 1st, 2013.

Frank Corbin ~ (coming from Magnet Division) joined the Design & Documentation Group June 1st, 2013.

## **DEPARTURES: Farewell, you will surely be missed..**

Tito J. Juarez ~ (RF/Accelerator Division) ~ last day was Thursday, June 27, 2013.

Eric Riehn ~ (Photocathode/Accelerator R&D Division) ~ last day was Thursday, June 27, 2013.

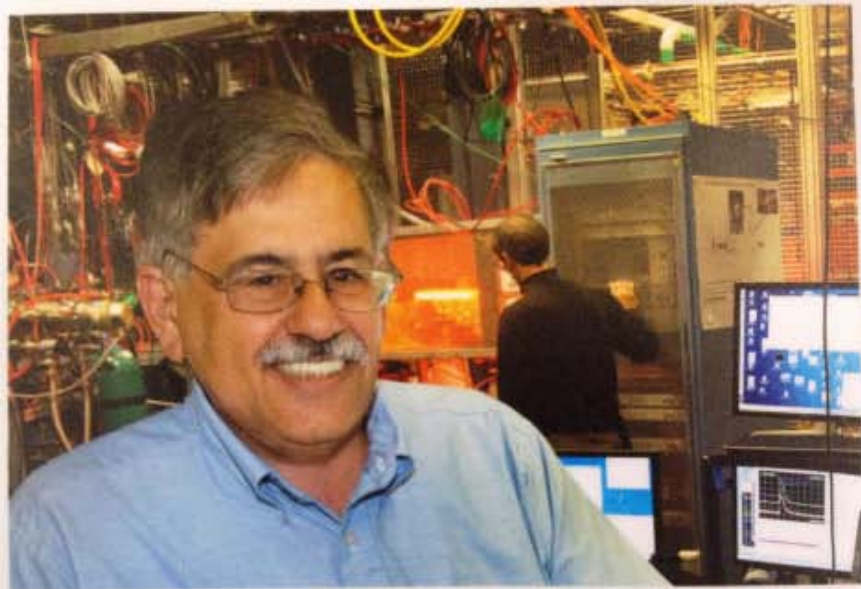
### Guest Appointments:

Todd Satogata ~ Guest Scientist ~ Expiration Date: August 31, 2013.

Jie Wie ~ Guest Scientist ~ Expiration Date: August 20, 2013.

## CONGRATULATIONS: **Robert Lambiase & Louis Snyderstrup**

Bob Lambiase and Lou Snyderstrup were honored with Engineering Awards for their achievements during the past year. If you see them in the hall please congratulate them, we are so honored to have these two men working with us.



**Robert F. Lambiase**



**Louis P. Snyderstrup**



Steve took this photo of the Super Moon on June 24th!

